The Claims:

1. A copper base alloy consisting essentially of, by weight:
from 0.35% to 5% titanium;
from 0.001% to 10% of X, where X is selected from Ni, Fe, Sn, P, Al, Zn, Si, Pb, Be, Mn, Mg, Bi, S, Te, Se, Ag, As, Sb, Zr, B, Cr and Co and combinations thereof;
and the balance copper and inevitable impurities, said alloy having an electrical conductivity of at least 50% IACS and a yield strength of at least 105 ksi..

2. The copper base alloy of claim 1 wherein X is selected from the group consisting of Ni, Fe, Co, Mg, Cr, Zr, Ag and combinations thereof.

3. The copper base alloy of claim 2 further consisting essentially of:
from 0.35% to 2.5% titanium;
from 0.5% to 5.0% nickel;
from 0.5% to 0.8% of iron, cobalt and mixtures thereof;
from 0.01% to 1.0% magnesium;
up to 1% of Cr, Zr, Ag and combinations thereof; and
the balance copper and inevitable impurities.

4. The copper base alloy of claim 3 further consisting essentially of:
from 0.8% to 1.4% titanium;
from 0.8% to 1.7% nickel;
from 0.9% to 1.1% of iron, cobalt and mixtures thereof;
from 0.1% to 0.4% magnesium;
up to 1% of Cr, Zr, Ag and combinations thereof; and
the balance copper and inevitable impurities.

5. A copper base alloy having an improved combination of yield strength, electrical conductivity, stress relaxation resistance consisting essentially of by weight of:

0.35 - 2.5% titanium;

0.5 - 5.0% nickel;

0.5 - 1.5% iron, cobalt and mixtures thereof;

0.01 - 1.0% magnesium;

up to 1% of Sn, Cr, Zr, Ag, Sn, P, Al, Zn, Si, Pb, Bi, S, Te, Se, Be, Mn, As, Sb, Zr, B and mixtures thereof;

and the balance copper and inevitable impurities.

6 The copper base alloy of claim 5 containing up to 1% of Cr, Zr, Ag and mixtures thereof.

7. The copper base alloy of claim 6 consisting essentially of

0.8 - 1.4% titanium;

0.8 - 1.7% nickel;

0.90 - 1.10% iron, or cobalt;

0.10 - 0.40% magnesium;

0.01% to 1.0% of Cr, Zr, Ag and mixtures thereof; and

the balance copper and inevitable impurities

8. A process for making a copper base alloy having an improved combination of yield strength, electrical conductivity and stress relaxation, comprising:

casting a copper base alloy that consists essentially, by weight, from 0.35% to 10% titanium, from 0.001% to 6% of X, where X is selected from Ni, Fe, Sn, P, Al, Zn, Si, Pb, Be, Mn, Mg, Bi, S, Te, Se, Ag, As, Sb, Zr, B, Cr and Co and combinations thereof and the balance copper and inevitable impurities;

hot rolling the alloy at from about 750°C to about 1,000°C;

first cold rolling the alloy to a reduction in area of from about 50% to about 97%;

first annealing the alloy at a temperature of from about 850°C to about 1,000°C for from about 10 seconds to about one hour, followed by a rapid cool to ambient;

second cold rolling the alloy up to about 80% reduction in area;

second annealing the alloy at from about 400°C to about 650°C for from about 1 minute to about10 hours;

third cold rolling the alloy from about a 10% to about a 50% reduction in area to finished gauge.

9. The process of claim 8 wherein following said third cold rolling step, said alloy is annealed at a temperature of from about 150°C to about 600°C for from about 15 seconds to about 10 hours.

10. The process of claim 9 wherein said first, second and third annealing steps have times and temperatures effective for said alloy to have a yield strength of at least 105 ksi and an electrical conductivity of at least 50% IACS at finish gauge.

11. A process for making a copper base alloy having an improved combination of yield strength, electrical conductivity, stress relaxation resistance, along with modest levels of bendability comprising:

casting a copper base alloy that consists essentially, by weight, from 0.35% to 10% titanium, from 0.001% to 6% of X, where X is selected from Ni, Fe, Sn, P, Al, Zn, Si, Pb, Be, Mn, Mg, Bi, S, Te, Se, Ag, As, Sb, Zr, B, Cr and Co and combinations thereof and the balance copper and inevitable impurities;

hot reducing the alloy at from about 750°C to about 1,000°C;

providing one or more cycles comprising cold reducing the alloy to a reduction in area of from about 50% to about 99% and then age annealing at an annealing temperature of from about 400°C to about 650°C for from about 15 secs. to about 10 hours;

cold reducing the alloy from about 40% to about 80% reduction in area;

age hardening the alloy by annealing at from about 400°C to about 650°C for from about 1 to about10 hours; and

final reducing the alloy from about a 10% to about a 50% reduction in area to finished gauge.

12. The process of claim 11 wherein following said final cold rolling step, said alloy is annealed at a temperature of from about 150°C to about 600°C for from about 15 seconds to about 10 hours.

13. The process of claim 12 wherein said annealing steps have times and temperatures effective for said alloy to have a yield strength of at least 105 ksi and an electrical conductivity of at least 50% at finish gauge.

14. A process for making a copper base alloy having high yield strength and moderate strength, electrical conductivity comprising:

casting a copper base alloy that consists essentially, by weight, from 0.35% to 10% titanium, from 0.001% to 6% of X, where X is selected from Ni, Fe, Sn, P, Al, Zn, Si, Pb, Be, Mn, Mg, Bi, S, Te, Se, Ag, As, Sb, Zr, B, Cr and Co and combinations thereof and the balance copper and inevitable impurities;

hot reducing the alloy at from about 750°C to about 1,000°C;

cold reducing the alloy to a reduction in area of from about 50% to about 99%;

solution annealing the alloy at a temperature of from about 950°C to about 1,000°C for from about 15 seconds to about one hour, followed by a rapid cool to ambient;

cold reducing the alloy from about 40% to about a 60% reduction in area;

age annealing the alloy at a temperature of about 400°C to about 650°C for from about 1 to about 10 hours;

cold reducing the alloy from about a 40% to about a 60% reduction in area;

age annealing the alloy a second time at a lower temperature than the first aging anneal of from about 375°C to about 550°C for from about 1 to about 3 hours; and

cold reducing at least about 30% reduction in area to a finished gauge.

15. The process of claim 14 wherein following said final cold rolling step, said alloy is annealed at a temperature of from about 150°C to about 600°C for from about 15 seconds to about 10 hours.

16. The process of claim 15 wherein said first, second and third annealing steps have times and temperatures effective for said alloy to have a yield strength of at least 105 ksi and an electrical conductivity of at least 50% IACS at finish gauge.

17. A process for making a copper base alloy having high yield strength and moderate strength, electrical conductivity comprising:

casting a copper base alloy that consists essentially, by weight, from 0.35% to 10% titanium, from 0.001% to 6% of X, where X is selected from Ni, Fe, Sn, P, Al, Zn, Si, Pb, Be, Mn, Mg, Bi, S, Te, Se, Ag, As, Sb, Zr, B, Cr and Co and combinations thereof and the balance copper and inevitable impurities;

hot rolling the alloy at from about 750°C to about 1,000°C;

cold rolling the alloy to a reduction in area of from about 50% to about 99%;

solution annealing the alloy at a temperature of from about 950°C to about 1,000°C for from about 10 seconds to about one hour, followed by a rapid cool to ambient;

cold rolling the alloy from about a 40% to about a 60% reduction in area;

age annealing the alloy at a temperature of about 500°C to about 575°C for from about 15 seconds to about 10 hours or at a temperature of about 425 to about 475°C for about 2.5 to about 3.5hours;

cold rolling the alloy from about a 40% to about a 60% reduction in area;

age annealing the alloy a second time at a temperature of from about 500°C to about 550°C for from about 1 to about 4 hours; and

final rolling at least about 30% reduction in area to a finished gauge.

18. The process of claim 17 wherein following said final cold rolling step, said alloy is annealed at a temperature of from about 150°C to about 600°C for from about 15 seconds to about 10 hours.

19. The process of claim 18 wherein said annealing steps have times and temperatures effective for said alloy to have a yield strength of at least 105 ksi and an electrical conductivity of at least 50% at finish gauge.